

CLAIMS

What is claimed is:

1. A wrist device for use with a prosthetic limb, comprising:

5 a base plate having an opening, the base plate being configured for attachment to a prosthetic limb;

a sliding lock plate having an opening, being slidably engaged with the base plate; and

10 a semi-cylindrical rotator with slots, wherein the semi-cylindrical rotator is configured for attachment to a prosthetic hand and coupled to the base plate in a manner that allows the sliding lock plate to lock into the slots.

2. A wrist device for use with a prosthetic limb as in claim 1, further comprising:

15 a primary latch return spring coupled between the base plate and the sliding lock plate, wherein the primary latch return spring biases the sliding lock plate in a locked position; and

a cover plate having an opening configured to receive the semi-cylindrical rotator, the cover plate being coupled to the base plate in a manner that limits movement of the sliding lock plate.

20 3. A wrist device for use with a prosthetic limb as in claim 1, further comprising:

two supporting arms attached to the base plate; and

25 a pivot pin coupled to the supporting arms of the base plate and the rotator in order to allow rotation of the rotator.

4. A wrist device for use with a prosthetic limb as in claim 1, wherein the semi-cylindrical rotator is positioned at least partially in the opening of the base plate and the opening of the sliding lock mechanism in order to minimize a height of the wrist device.

30 5. A wrist device for use with a prosthetic limb as in claim 1, further comprising an opening in a central portion of the semi-cylindrical rotator.

6. A wrist device for use with a prosthetic limb as claimed in claim 5,

further comprising wires routed through the opening in the base plate, the opening in the sliding lock plate, the opening in the cover plate, and the opening in the central portion of the semi-cylindrical rotator.

5 7. A wrist device for use with a prosthetic limb as claimed in claim 6, wherein the wires are wrapped around a neural axis in a manner that reduces the effects of repetitive flexing of the wires.

10 8. A wrist device for use with a prosthetic limb as claimed in claim 6, wherein the wires are multi-strand wires that can withstand repetitive flexing.

 9. A wrist device for use with a prosthetic limb as claimed in claim 1, wherein the sliding lock plate extends a full width of the wrist device.

15 10. A prosthetic device comprising:
 a base plate configured for attachment to a prosthetic arm;
 a sliding lock plate coupled to the base plate; and
 a semi-cylindrical rotator with slots and configured for attachment to a
 prosthetic hand, wherein the semi-cylindrical rotator is coupled to the base plate in a
20 manner that allows the sliding lock plate to lock into the slots of the semi-cylindrical rotator.

 11. A prosthetic device as claimed in claim 10, further comprising:
 a lower mounting plate coupled to the base plate;
25 a cover plate coupled to the base plate;
 a wrist quick disconnect unit coupled to the lower mounting plate;
 an upper mounting plate coupled to the semi-cylindrical rotator; and
 a mechanical hand coupled to the upper mounting plate.

30 12. A prosthetic device as claimed in claim 11, further comprising:
 a coax connector coupled to the wrist quick disconnect unit; and
 a bundle of wires coupled to the coax connector and routed through the wrist
 disconnect unit, the lower mounting plate, the base plate, the sliding lock mechanism,

the semi-cylindrical rotator, the cover plate, and the upper mounting plate, and coupled to the mechanical hand.

- 5 13. A prosthetic joint, comprising:
 a base plate configured for attachment to a prosthetic arm;
 a locking rotator structure, wherein the locking rotator structure is rotatably
 attached to the base plate and includes a sliding lock plate and a semi-cylindrical
10 rotator;
 a prosthetic hand coupled to the semi-cylindrical rotator of the locking rotator
 structure; and
 a torsional spring coupled to the base plate and to the prosthetic hand in a
 manner that enables the locking rotator structure to exhibit compliance in a flexion
 direction and an extension direction.
- 15 14. A prosthetic device as in claim 13, further comprising a secondary latch that
 holds the sliding lock plate in an unlocked position and allows compliant flexion and
 extension movement of the prosthetic hand.
- 20 15. A prosthetic device as in claim 13, wherein the secondary latch is a ring
 configured to slide over the sliding lock mechanism.
16. A prosthetic device configured for attachment to an amputee's arm,
 comprising:
25 a prosthetic hand;
 a locking wrist rotator structure, wherein the locking wrist rotator structure
 includes a sliding lock mechanism and a semi-cylindrical rotator with locking slots
 configured for engagement with the sliding lock mechanism;
 a torsional spring coupled to the locking wrist rotator structure and to the
30 prosthetic hand in a manner that allows the prosthetic hand to exhibit compliance in a
 flexion direction and an extension direction.
17. A prosthetic device as claimed in claim 14, further comprising a

secondary latch that holds the sliding lock mechanism open and allows the wrist to rotate freely.

18. A prosthetic device as in claim 15, wherein the secondary latch is a
5 ring configured to slide over the sliding lock mechanism.

10

15

20

25

30